horizon

MODEL 642VES

Model 642VES Operator's Manual

Laboratory Centrifuge

THE DRUCKER CO.
Providing Quality Centrifuges since 1932

P/N 7711072 Rev. C

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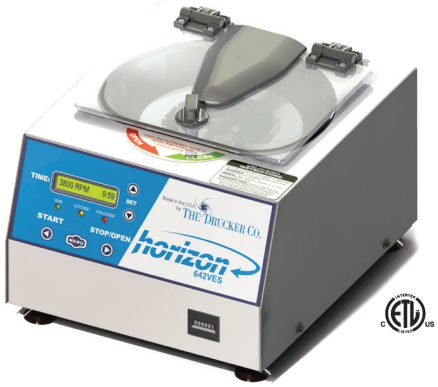
WARNING

Use universal precautions when handling laboratory specimens. All human specimens of blood, blood compounds, or bodily fluids are potentially biohazardous and may contain Hepatitis B virus, Hepatitis C virus, Human immunodeficiency virus or other disease causing agents. For the safety of both the operator and service personnel, care should be taken when handling substances that are known to be toxic, radioactive, or contaminated with pathogenic microorganisms when using this centrifuge. When Risk Group II materials are used (as identified in the World Health Organization "Laboratory Bio-Safety Manual"), the use of a Bio-Seal should be employed. More than one level of protection must be provided in the case of materials of a higher group. The use of flammable or explosive materials as well as those materials which chemically react vigorously is prohibited.

Model Description

The Horizon Model 642VES is a continuous-duty, electronically-controlled, variable-speed, laboratory centrifuge with a lid safety interlock system. The unit also incorporates a backlit display, making accessing and controlling centrifugation parameters easier than ever. The 642VES offers the user control over many parameters, including variable runtime, speed control, and deceleration. The exclusive Drucker horizontal rotor allows for quick and easy sample loading and complete horizontal separation. Up to ten commonly used settings can be saved and recalled at the touch of a button.



Intended Use

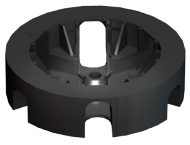
General purpose laboratory centrifuge for sample separation.

Device Classification

FDA Class One

Supplied Accessories (Standard)

See next page for optional rotor/accessories



One (1) 6-Carrier Horizontal Rotor 7786021*

Six (6) 100 mm Carriers 7713031*

Six (6) 75 mm Carriers 7713033*

*The rotor and rotor accessories are rated for a rotational speed of 5000 RPM.

Also included (not shown):

- One (1) 10´ Line Cord 7760006 (United States) 7760005 (Europe)
- One (1) Operator's Manual 7711072

See the next page for a description of optional accessories.

WARRANTY:

The Drucker Company warranties that this centrifuge is free from defects in workmanship and parts for 2 years.

Made in the USA by

THE DRUCKER CO.

Providing Quality Centrifuges since 1932

200 Shadylane Drive • Philipsburg, PA 16866
Phone: 814-342-6205 or 814-692-7661 • Fax: 814-692-7662 • www.druckercompany.com

Specifications

General Specifications for the Horizon Model 642VES Centrifuge

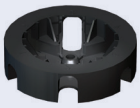
Speed Range (Horizontal Rotor): ..... 1,000 - 3,200 rpm (+/- 100 rpm)
Speed Range (Fixed-angle Rotor): ..... 1,000 - 3,900 rpm (+/- 100 rpm)
Maximum Capacity (Horizontal Rotor): ... 60 mL (6 × 10 mL)
Maximum Capacity (Fixed-angle Rotor): .. 90 mL (6 × 15 mL)
Operating Voltage Ranges: ..... 103 - 127 VAC or 207 - 253 VAC
Overall Dimensions (H x W x D): ..... 9.0″ × 11″ × 12.5″ (22 cm × 28 cm × 32 cm)
Centrifuge Motor: ..... 1/30 HP, PSC motor
Nominal Acceleration Time: ..... 10 seconds
Protection Breaker: ..... 4 Amp. re–settable
Timer: ..... Electronic, with hold or 0 to 99 minutes, +/- 1%
Weight: ..... 18.5 lbs. (8.4 kg)

Permitted Environmental Conditions

Ambient Temperature During Operation: 2 °C - 40 °C
Maximum Relative Air Humidity: 90%

Electrical Requirements

Power (Watts): 200
Voltage (Volts): ..... 115 VAC (+/- 10), 230 VAC (+/- 20)*
**Check Serial Number Badge for Your Model Specific Voltage Requirement.*
Frequency (Hz): 50/60

		PART NO.	#	MAX TUBE SIZE	SPEED RANGE	FORCE RANGE
	**6-Place Horizontal Rotor**	7786021				
	75 mm tube holder	7713033	6	17 mm x 75 mm	1,000 to 3,200 RPM	111 to 1,134 xg
	100 mm tube holder	7713031	6	17 mm x 100 mm	1,000 to 3,200 RPM	139 to 1,425 xg
	This rotor or rotor accessory is rated for a rotational speed of 5000 rpm and a force of 3,475 xg					
	6-Place Fixed-angle Rotor	7786047				
	75 mm tube holder	7713033	6	17 mm x 75 mm	1,000 to 3,900 RPM	88 to 1,339 xg
	100 mm tube holder	7713031	6	17 mm x 100 mm	1,000 to 3,900 RPM	105 to 1,598 xg
	125 mm tube holder	7713032	6	17 mm x 125 mm	1,000 to 3,900 RPM	122 to 1,857 xg
	This rotor or rotor accessory is rated for a rotational speed of 4,500 rpm and a force of 2,475 xg					

Contact your authorized dealer or The Drucker Co. to order accessories.

75 mm Tube Holder
p/n 7713033

100 mm
Tube Holder
p/n 7713031

125 mm
Tube Holder
p/n 7713032

Tube Holder Cap
p/n 7713011

1″ Cushion Spacer
p/n 1525

Any use other than those specified by the Manufacturer is explicitly prohibited.
Maximum sample density is 1.15 grams / mL, (water density = 1.0 grams / mL)

Care and Preventative Maintenance

With proper care and maintenance your Horizon centrifuge will provide years of laboratory service. For proper care, the following steps should be taken:

1. Provide Adequate Ventilation: For cooling purposes, the Horizon draws in ambient air through the air intake cover on the top of the lid and exhausts this air in the rear of the base. The centrifuge should be placed on a hard smooth surface for good air circulation.

2. Always Spin Balanced Loads: For maximum centrifuge life, always run balanced loads. Refer to pages 8 and 9 for additional information on balancing the load.

3. Keep the Tube Carriers / Holders Clean: NOTE: Always follow the safety guidelines of your laboratory to properly clean up and/or dispose of materials in the event that a substance is known to be potentially toxic, radioactive, or contaminated with a pathogenetic microorganism is spilled in or on the centrifuge. Small glass fragments left in the tube carrier/holder after a tube breakage may adhere to the next test tube inserted in that carrier/holder. When this tube is handled, these fragments may puncture protective gloves and lacerate the operator's fingers or hand. Remaining fragments may provide stress points on subsequent tubes and result in additional breakage. If a tube breakage occurs, carefully remove the tube holder. Properly dispose of the sample and tube fragments and thoroughly clean both the inside and outside of the tube carrier/holder. Insert a new tube cushion (if necessary) and replace the tube carrier/holder in the rotor.

4. Motor and Electrical Maintenance: This centrifuge uses a brushless AC motor. There are no brushes to replace and it should not need routine servicing for the life of the centrifuge. The electrical components are selected for high reliability and should not need service.

5. Keep the Centrifuge Clean: The cabinet, rotor top and accessories shall be thoroughly cleaned using either isopropyl alcohol, soap and water, or a mild bleach solution. The use of Fully/Partially Halogenated Hydrocarbons, Ketones, Esters, and all other chemicals not prescribed by the manufacturer may cause damage to the rotor and tube carriers/holders and shall not be used.

If it is necessary to remove the rotor for additional cleaning, it is required that a qualified technician remove the outside housing and rotor assembly. Contact The Drucker Company for additional information.

Apply cleaning solutions with a towel or cloth. Do not submerge the centrifuge in water or other cleaning solutions as this will cause damage and void your warranty!

6. Tube Carrier / Holder Replacement: It is recommended that the tube holders be replaced after 24 months of use. Inspect tube holders regularly for cracks. If cracks are discovered, replace immediately.

7. Gasket Replacement: The Drucker Company recommends the immediate replacement of any damaged or worn centrifuge gaskets.

8. Disposal of Centrifuge and accessories: Follow all applicable regulations for the disposal of biohazardous and/or electronic waste.

Setup Location

1. Unpack the centrifuge and verify that all of the supplied equipment is present.
2. Choose a setup location which meets the following criteria:
    a) A bench top clearance height of 20" is required in order to open the lid.
    b) The clearance envelope is the space around the centrifuge which is required for safety. Choose a setup location which will allow for a clearance envelope of at least 24" x 24", (with the centrifuge at the center). No person or hazardous material shall be permitted in the clearance envelope during operation. The operator time within the envelope shall be limited to the time necessary for loading, unloading and centrifuge operation only.
    c) Proper ventilation is necessary to prevent the overheating of samples as well as premature failure of the centrifuge. Choose an area which will allow unencumbered air flow.
    d) The centrifuge is designed to rest on its four rubber feet. No adjustment is necessary for leveling the centrifuge, however, the surface should be flat and level.
    e) Be sure the outlet is always within reach as the line cord is the means of emergency disconnection.

Initial Setup Procedure

If any problems are found during the initial setup procedure, refer to the troubleshooting section. For further assistance, contact The Drucker Company at 814-342-6205 or 814-692-7661.

1. Plug the female end of the line cord into the rear of the centrifuge. Plug the male end into an approved electrical outlet. For electrical safety, the unit must always be properly grounded.
2. For operator safety, the locking system is always active; requiring power and direction from the user to disengage it (the lid also automatically unlocks at the end of a run when it is safe to do so). To unlock the lid (in order to access the rotor chamber) press the 'OPEN/STOP' button on the control panel. The 'UNLOCKED' indicator light should illuminate. If it does not, refer to the section on troubleshooting. The lid will remain unlocked for 15 seconds after pressing the 'OPEN/STOP' button.
3. Turn the latch counterclockwise and open the lid.
4. Spin the rotor by hand; check for free and level rotation. If the rotor does not spin freely, refer to the section on troubleshooting.
5. Place the test tube holders inside the rotor and verify that they are seated properly.
6. Close the lid. Rotate the lid knob clockwise to its complete stop position. The 'LATCHED' indicator light should be illuminated. If it is not, make sure that the lid is latched properly. The centrifuge will not run unless the lid is latched properly and the 'LATCH' indicator light is illuminated.
7. Initiate a test run by pressing the 'START' button.
8. The 'RUNNING' indicator light will illuminate
9. The test tube carriers will slide up into the horizontal position (horizontal rotor only) and the unit will accelerate to the current set speed.
10. Listen to the sound of the centrifuge. A smooth whirring sound should be heard. If there are any loud or unusual sounds, stop the centrifuge by pressing the 'OPEN/STOP' button immediately and refer to the section on troubleshooting.
11. Press the 'OPEN/STOP' button to terminate the test run. The rotor will decelerate to a complete stop and the lid will then unlock automatically for 60 seconds.
12. The centrifuge is now ready for operation.
13. In the event that the display and/or indicator lights do not function properly, do not use the centrifuge; have it serviced immediately.

Transportation

During transportation accessories can become dislodged from the rotor and fall into the rotor chamber where they can remain unnoticed. In the event that the centrifuge needs to be transported to another site, make certain that there are no tube holders or accessories in the rotor or rotor chamber.

Operation

NOTE: Follow the initial setup procedure before initial operation.

1. Press the 'OPEN / STOP' button to unlock the lid and then open the lid.
2. Insert cushions (if needed) into the tube carriers/holders for the tube size you are using. Refer to 'Tube Holder Configurations' for assistance.
3. Place the test tube samples into the tube carriers/holders. Be sure to follow the rules for balanced loads.
4. Close the lid and turn the lid knob clockwise to its complete stop position. The 'LATCHED' indicator light should illuminate to indicate that the latch is closed properly. If the lid knob is not completely latched, the 'LATCHED' indicator light will not illuminate and the centrifuge cannot be operated.
5. To access and program the memory locations, press the MENU key.
6. Move the cursor to the desired parameter with the left and right scroll keys ('START' and 'STOP/OPEN')
7 Changing a parameter is accomplished with the SET keys.
8. Exit the program menu by pressing the MENU key.
9. Any changes are automatically saved upon exiting the program menu.

Programming Example

Follow these steps to program a memory location to process samples with the horizontal rotor and 100 mm tube holders for 15 minute at 3,200 rpm with medium end of cycle braking.

1. Press the MENU key.
2. Use the SET keys to select the desired memory location to modify.
3. Use the scroll keys to highlight a rotor.
4. Use the SET keys to select the horizontal rotor.
5. Use the scroll keys to highlight a tube holder.
6. Use the SET keys to select the 100 mm tube holder.
7. Use the scroll keys to highlight the time.
8. Use the SET keys to select 15 minute.
9. Use the scroll keys to highlight an rpm.
10. Use the SET keys to select 3,200 rpm.
11. Use the scroll keys to highlight the braking magnitude.
12. Use the SET keys to select a mid-range value of 5.
13. Exit the programming menu and save the settings by pressing the MENU key.
14. The centrifuge is ready to run.

Executing a Program

1. Press the MENU key to access the program menu.
2. Use the SET keys to select the desired pre-programmed memory location.
3. Press the MENU key to exit the program menu; the program is now ready to be executed.
4. Begin the run by pressing the 'START' button on the control panel.
5. The centrifuge should begin to spin. The 'RUNNING' indicator light should illuminate.

IF A PROBLEM IS FOUND DURING A SPIN THAT REQUIRES THE CENTRIFUGE TO SHUT DOWN, PRESS THE 'OPEN / STOP' BUTTON IMMEDIATELY !

6. After time has elapsed, the 'RUNNING' indicator light will turn off and the rotor will decelerate to a complete stop.
7. The 'UNLOCKED' indicator light will illuminate and the locking mechanism will disengage, allowing entry into the rotor chamber. If the automatic unlock times out (after 60 seconds) simply press the 'OPEN/STOP' button.
8. Turn the lid knob counterclockwise and open the lid.
9. Remove the samples.

Tube Holder Configurations

The next two pages will describe proper balancing and tube loading. Use the appropriate section for the rotor installed in your centrifuge. Improper loading can result in damage to the centrifuge or test tube samples.

6-Place Horizontal Rotor (Standard)

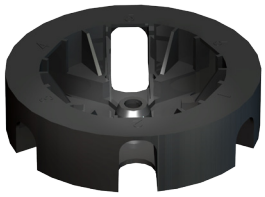
This rotor is designed to hold up to six tube holders. It comes with two tube holder types. The red/purple holders are designed to hold tubes up to 10 mL (up to 17 mm x 100 mm). The green/blue holders are designed to hold tubes up to 5 mL (up to 17 mm x 75 mm). See page 4 for rotational frequency ratings.

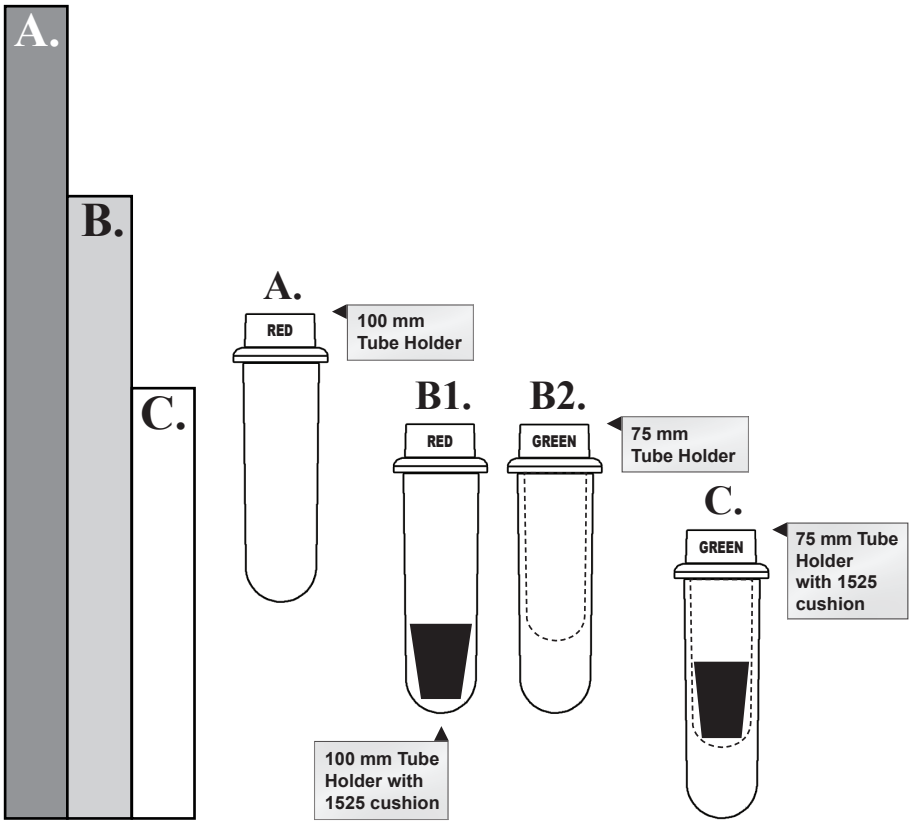
Your centrifuge must contain a balanced load in orde to work properly. To ensure that the load is balanced, keep these rules in mind when inserting test tube samples into the six position horizontal rotor:

1. Opposing tube holders must be identical.
2. Opposing tube holders must be empty or loaded with equally weighted samples.
3. If an odd number of samples is to be spun, use a water-filled tube with the unpaired one.

Directions:

1. Compare the tube to be spun with the boxes shown here.
2. Find the box that most closely matches the tube's length. NOTE: The tube length with its stopper or cap must be shorter than the chosen box.
3. Match the letter from the chosen box with one of the configurations shown. For Example: A tube as long as box B. Accordingly, we can use a 100 mm tube holder with a 1525 cushion or a 75 mm tube holder with no cushion, (configurations B1 or B2).





6-Place Fixed-angle Rotor (optional)

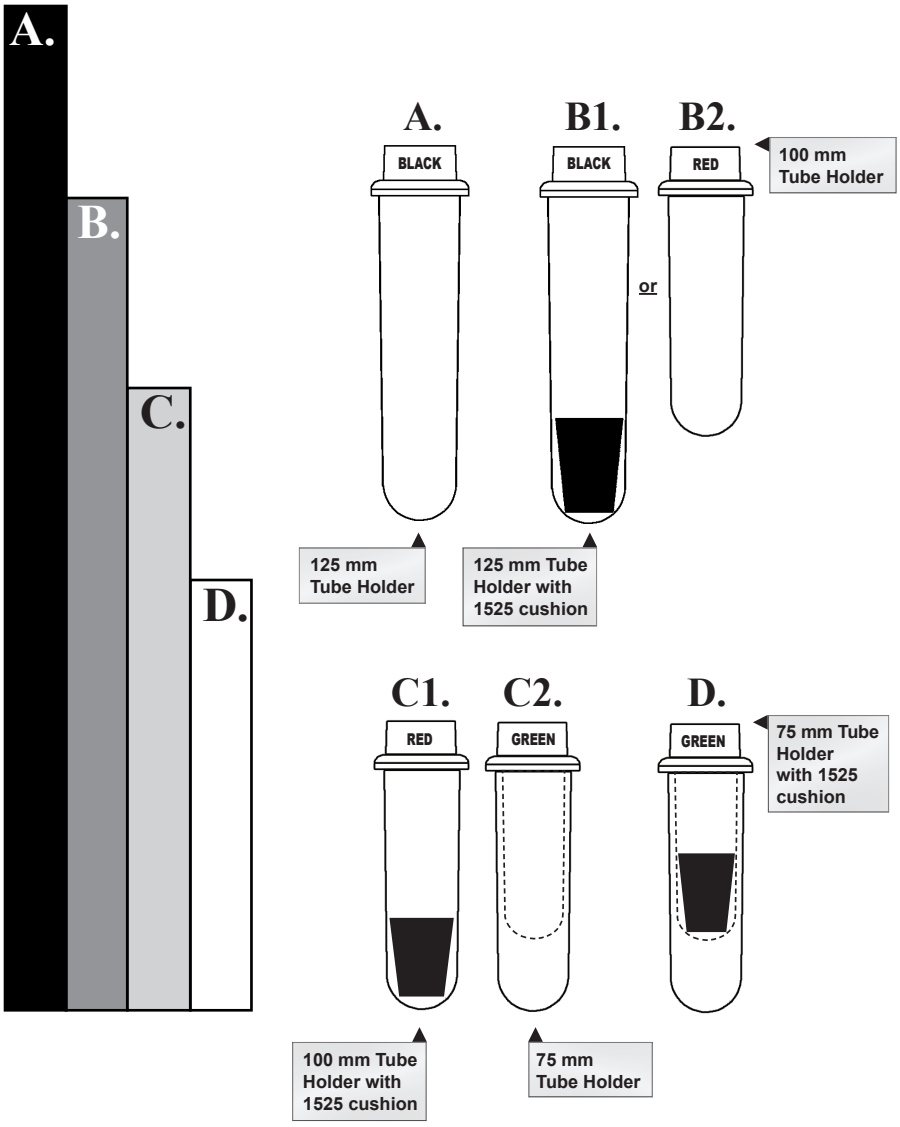
This rotor is designed to hold up to six tube holders. It comes with three tube holder types. The black/orange holders are designed to hold tubes up to 15 mL (up to 17 mm x 125 mm). The red/purple holders are designed to hold tubes up to 10 mL (up to 17 mm x 100 mm). The green/blue holders are designed to hold tubes up to 5 mL (up to 17 mm x 75 mm). See page 4 for rotational frequency ratings.

Your centrifuge must contain a balanced load in order to work properly. To ensure that the load is balanced, keep these rules in mind when inserting test tube samples.

1. Opposing tube holders must be identical.
2. Opposing tube holders must be empty or loaded with equally weighted samples.
3. If an odd number of samples is to be spun, use a water-filled tube with the unpaired one.

Directions:

1. Compare the tube to be spun with the boxes shown here.
2. Find the box that most closely matches the tube's length.
   NOTE: The tube length with its stopper or cap must be shorter than the chosen box.
3. Match the letter from the chosen box with one of the configurations shown. For Example: A tube as long as box B. Accordingly, we can use a 125 mm tube holder with a 1525 cushion or a 100 mm tube holder with no cushion, (configurations B1 or B2).



Troubleshooting:

1. Problem: The rotor does not spin freely.

Solutions:

- Make sure that nothing has fallen into the rotor chamber.
- If there is nothing obstructing the rotor, the motor may be damaged.

Contact your authorized dealer or The Drucker Company for further assistance.

2. Problem: There is excessive noise when the machine is running.

Solutions:

- Check to see that the load is balanced.
- Make sure that nothing has fallen into the rotor chamber.
- Make sure that the screw in the center of the rotor is snug.
- The motor may be damaged.

Contact your authorized dealer or The Drucker Company for further assistance.

3. Problem: The centrifuge does not run or an error message is displayed.

Solutions:

- Make sure that the centrifuge is getting power. Does the control panel come on? Check the electrical outlet that the unit is plugged into. Check the circuit breaker on the base near the rear of the centrifuge.
- If the unit is getting power, make sure that the lid latch is closed properly. The latch is closed properly when the yellow 'LATCHED' indicator lightis illuminated.

Contact your authorized dealer or The Drucker Company for further assistance.

4. Problem: The lid knob cannot be turned / the lid cannot be unlocked.

Solutions:

- Make sure the centrifuge has power and that the rotor is stopped. Press the 'OPEN/STOP' button. The red 'UNLOCKED' indicator light should illuminate and the unlocked mechanism should disengage, allowing entry into the lid.
- If the lid is still locked, make sure that the red 'UNLOCKED' indicator is illuminated and turn the lid knob first completely clockwise and then counterclockwise.
- If the red 'UNLOCKED' indicator will not illuminate or the locking mechanism will not disengage, the electronics or locking mechanism may be damaged. Have a technician service the centrifuge or contact The Drucker Company for further assistance.

WARNING:

High voltages exist within the centrifuge circuitry. Use universal precautions for high voltages if the centrifuge cabinet has been removed

For additional assistance, contact technical support
Monday-Friday, 8:30 AM - 5:00 PM, EST

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The Horizon Model 642VES complies with all requirements of UL 61010A-1, UL 61010A-2-020, UL 61010A-2-010, UL 3101-2-20, Can/CSA C22.2 No. 1010.1, Can/CSA C22.2 No.1010.2.020

Safety:

Horizon Lid Safety Switch: The Horizon lid is secured to the top of the cabinet by a latching knob and pawl system. When the knob is rotated clockwise, the pawl grips the underside of the cabinet opening and prevents the lid from opening. A mechanical stop positions the pawl and prevents it from rotating completely. When rotated to the stop position, the pawl makes contact with a micro–switch mounted underneath the cabinet top.The lid safety switch prevents the centrifuge from operating while the lid is open. The yellow 'LATCHED' indicator light on the front of the machine will illuminate when the lid has been latched properly.

Horizon Lid Safety Interlock System: In addition to the Lid Safety Switch, the Horizon has a true "0 RPM" lid locking system. The lid safety interlock system keeps the lid locked at all times, (even during power failure), and requires that the rotor be at rest in order to unlock the lid. The centrifuge will not allow entry into the rotor chamber unless the centrifuge has power and the rotor is stopped. To open the lid, make sure that the centrifuge is plugged in and, with the rotor stopped, press the 'OPEN / STOP' button.

NOTE: After the centrifuge has started spinning, it may be possible to rotate the lid knob enough to cause the pawl to lose contact with the lid safety switch. If this happens, the centrifuge motor may lose power, but the lid will still remain locked. If the knob is accidentally moved and this situation should occur, rotate the knob fully clockwise to its stop position and the centrifuge will resume operation.

Circuit Breaker:

The Horizon is protected with a 4 Amp circuit breaker located at the rear of the machine mounted to the base. Any electrical short circuit will cause the breaker to cut power to the machine.

Emergency Rotor Chamber Entry:

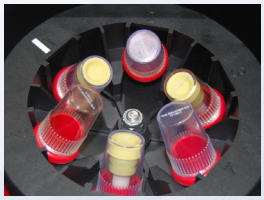
In the event of power failure, it may be impossible to unlock the lid by conventional means. In this case, entry into the rotor chamber may be made by removing the latch label and using a pen to manually disengage the locking mechanism (see photo). Pull the mechanism towards the control panel and then unlatch and open the lid. If the unit is damaged, contact your authorized dealer or The Drucker Company.

Calibration and Earth Ground Testing:

It is recommended that the top speed, ground continuity and line leakage be tested every two years for continued safe operation. Contact The Drucker Company for further information or testing availability. For PAT testing-ensure that your portable appliance tester is set to DC flash test. The centrifuge has an EMC mains filter. This can result in spurious failures if an AC dielectric test is used. Apply the minimum test cycles: repeated flash tests can lead to deterioration of insulation.

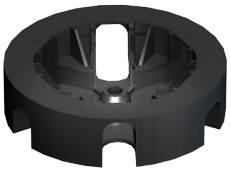
Speed Verification:

1. Press the STOP/OPEN button to unlock and open the lid.
2. Place the counter balance tubes (p/n 7700002, available from The Drucker Company) into the tube carriers/holders in the odd numbered locations on the rotor, leaving the other three tube carriers/holders empty as shown in the pictures on the right.
3. Make sure there is a reflective strip on the rotor.
4. Close and lock the lid.
5. Press the MENU key and choose the desired parameters to be tested by either choosing a memory location or selecting parameters with the scroll keys. Make sure the correct tube size is selected.
6. Press MENU to exit the program menu.
7. Press the START button to begin the run.
8. Using a non-contact tachometer measure the rpm by aiming it where the reflective strip is located.
9. Verify that the speed is within ±100 rpm of the set speed.



Replacement Parts:

Part No.	Description
7724037	Foot, rubber
7745017	Lid lock, tray assembly
7786047	Rotor, 6-place, fixed-angle
7786021	Rotor, 6-place, horizontal
7735049	Motor, 1/30 HP, 115 VAC
7729006	Capacitor, 4µF, 250 VAC
7717072	Motherboard
7751043	Circuit Breaker
7760005	Line Cord (Europe)
7760006	Line Cord (United States)
7714101	Pawl, latch, lid
7714103	Knob, latch, lid
7712316	Lid
7724071	Hinge, friction
7713031	100 mm tube holder, red
7713033	75 mm tube holder, green



6-Place
Horizontal Rotor
p/n 7786021

6-Place
Fixed-angle Rotor
p/n 7786047

125 mm Tube Holder
For 17 mm x 125 mm tubes
(For fixed-angle rotor only)
p/n 7713032

100 mm Tube Holder
p/n 7713031

75 mm Tube Holder
p/n 7713033

1˝ Tube Cushion
p/n 1525

0.25˝ Tube Cushion
p/n 9150

Tube Holder Caps
p/n 7713011

Counter Balance Tubes
p/n 7700002

Contact your authorized dealer or The Drucker Company to order replacement parts or accessories.

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